

CLAIMS

1. An audio conferencing system, comprising:

a data bus;

a network interface circuit that receives audio signals associated with participants in a conference, and provides digitized audio signals in assigned time slots over said data bus; and

a plurality of digital signal processors adapted to communicate on said data bus, wherein a first of said plurality of digital signal processors receives said digitized audio signals associated with conference participants who are speaking, and sums a plurality of said digitized audio signals to provide to a second of said plurality of digital signal processors a summed conference signal and a conference list indicative of said digitized audio signals summed to generate said summed conference signal, wherein for each conference participant on said conference list said second of said plurality of digital signal processors removes said digitized audio signal associated with the conference participant from said summed conference signal to provide a unique conference signal for the conference participant.

2. The audio conferencing system of claim 1, further comprising:

a system bus; and

a controller that communicates with said plurality of digital signal processors over said system bus, and downloads executable program instructions to said digital signal processors.

3. The audio conferencing system of claim 1, wherein said first of said plurality of digital signal processors is configured as an audio conference mixer, said second of said plurality of

3 digital signal processors is configured as an audio processor that receives said digitized audio
4 signals and determines which of said digitized audio signals comprises voice data and provides
5 a speech list indicative thereof to said audio conference mixer, which sums a plurality of said
6 digitized audio signals identified in said speech list to provide said summed conference signal.

1 4. The audio conferencing system of claim 3, wherein said speech list comprises a
2 plurality of speech bits, each uniquely associated with one of said digitized audio signals.

1 5. The audio conferencing system of claim 4, wherein said conference list comprises a
2 plurality of conference bits, each uniquely associated with one of said digitized audio signals.

1 6. The audio conferencing system of claim 3, wherein at least one of said plurality of
2 digital signal processors is configured as a DTMF tone detector, which receives and tests each
3 of said audio signals to determine if a DTMF tone is present and provides a DMTF detect bit
4 indicative thereof, wherein each of said audio signals has a uniquely associated DTMF detect
5 bit.

1 7. The audio conferencing system of claim 6, wherein said audio conference mixer also
2 receives said DTMF status bits and checks said DTMF detect bit associated with any digitized
3 audio signal to be added to said summed conference signal based upon said speech list, to
4 ensure that said summed conference signal does not include any of said digitized audio signals
5 whose associated said DTMF detect bit indicates the presence of a DTMF tone.

1 8. The audio conferencing system of claim 6, wherein said audio processor computes an
2 audio detection threshold value based upon said audio signal values, and compares said audio
3 signals to said audio detection threshold value to determine which of said audio signals
4 comprises audio and provides an indication thereof in said speech list.

1 9. The audio conferencing system of claim 3 wherein said audio processor provides said
2 plurality of digitized audio signals to said audio conference mixer over a dedicated
3 communications link between said audio processor and said audio conference mixer.

1 10. The audio conferencing system of claim 3 wherein said audio processor provides said
2 plurality of digitized audio signals to said audio conference mixer over said data bus.

1 11. An audio conferencing platform, comprising:

2 means for receiving audio signals associated with conference participants, and for
3 providing a digitized audio signal and a speech bit for each of said audio signals, wherein said
4 speech bit indicates whether or not said associated digitized audio signal includes voice data
5 from the associated conference participant;

6 an audio conference mixer adapted to receive said digitized audio signals and said
7 speech bits, and sum a plurality of said digitized audio signals based upon the state of said
8 speech bits to provide a summed conference signal, and provide a conference list indicative of
9 the conference participants whose voice is included in said summed conference signal; and

10 means for receiving said summed conference signal and said conference list, for

11 providing said summed conference signal to each of said conference participants that are not on
12 said conference list, and for each conference participant on the conference list removing the
13 digitized audio signal associated with that conference participant from said summed conference
14 signal and providing a resultant difference audio signal to the conference participant on said
15 conference list.

1 12. The audio conferencing platform of claim 11, wherein said audio conference mixer
2 comprises a first digital signal processor.

1 13. The audio conferencing platform of claim 12, wherein said means for receiving audio
2 signals comprises a network interface circuit and a second digital signal processor configured
3 to operate as an audio processor, wherein said network interface circuit and said audio
4 processor are interconnected by a time division multiplex (TDM) bus.

1 14. The audio conferencing platform of claim 11, wherein said means for receiving said
2 summed conference signal and said conference list comprises a digital signal processor.

1 15. The audio conferencing platform of claim 11, further comprising a time division
2 multiplex (TDM) bus that interconnects (i) said means for receiving audio signals associated
3 with conference participants, (ii) said audio conference mixer and (iii) said means for receiving
4 said summed conference signal and said conference list, wherein said summed conference
5 signal and said conference list are provided over said TDM bus.

1 16. The audio conferencing platform of claim 11, wherein said audio conferencing
2 platform supports a plurality of simultaneous conferences and said means for receiving audio
3 signals further comprises,

4 means for DTMF tone detection that tests each of said audio signals to determine if a
5 DTMF tone is present and provides a DTMF detect bit indicative thereof, wherein each of said
6 audio signals has a uniquely associated DTMF detect bit.

1 17. The audio conferencing platform of claim 16, wherein said audio conference mixer
2 comprises means for checking said DTMF detect bit associated with any digitized audio signal
3 to be added to said summed conference signal based upon said speech list, to ensure that said
4 summed conference signal does not include digitized audio signals whose associated DTMF
5 detect bit indicates the presence of a DTMF tone.

1 18. An audio conferencing platform, comprising:

2 input circuitry adapted to received audio signals associated with conference participants,
3 and provide a digitized audio signal and a speech bit for each of said audio signals, wherein
4 said speech bit indicates whether or not said associated digitized audio signal includes voice
5 data from the associated conference participant;

6 an audio conference mixer adapted to receive said digitized audio signals and said
7 speech bits, and sum a plurality of said digitized audio signals based upon the state of said
8 speech bits to provide a summed conference signal, and provide a conference list indicative of
9 the conference participants whose voice is included in said summed conference signal; and

10 processing circuitry adapted to receive said summed conference signal and said
11 conference list, to provide said summed conference signal to each of said conference
12 participants that are not on said conference list, and for each conference participant on the
13 conference list removing the digitized audio signal associated with that conference participant
14 from said summed conference signal and providing a resultant difference audio signal to the
15 conference participant on said conference list.

1 19. An audio conferencing platform that provides a summed conference signal, said
2 platform comprising:

3 input circuitry adapted to received audio signals associated with conference participants,
4 and provide a digitized audio signal and a speech bit for each of said audio signals, wherein
5 said speech bit indicates whether or not said associated digitized audio signal includes voice
6 data from the associated conference participant; and

7 a centralized audio conference mixer adapted to receive said digitized audio signals and
8 said speech bits, and sum a plurality of said digitized audio signals based upon the state of said
9 speech bits to provide a summed conference signal, and provide a conference list indicative of
10 the conference participants whose voice is included in said summed conference signal.